

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference P63948/GPTU63	<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. PCT/EP2004/052616	International filing date (day/month/year) 21.10.2004	Priority date (day/month/year) 22.10.2003	
International Patent Classification (IPC) or national classification and IPC H01L21/58, H05K13/04			
Applicant MARCONI COMMUNICATIONS GMBH et al.			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> <i>(sent to the applicant and to the International Bureau)</i> a total of sheets, as follows:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</li> <li><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</li> </ul> <p>b. <input type="checkbox"/> <i>(sent to the International Bureau only)</i> a total of (indicate type and number of electronic carrier(s)), containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Box No. I Basis of the opinion</li> <li><input type="checkbox"/> Box No. II Priority</li> <li><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li><input type="checkbox"/> Box No. IV Lack of unity of invention</li> <li><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li><input type="checkbox"/> Box No. VI Certain documents cited</li> <li><input checked="" type="checkbox"/> Box No. VII Certain defects in the international application</li> <li><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</li> </ul>			
Date of submission of the demand 09.08.2005	Date of completion of this report 14.12.2005		
Name and mailing address of the international preliminary examining authority: European Patent Office - Gitschner Str. 103 D-10958 Berlin Tel. +49 30 25901 - 0 Fax: +49 30 25901 - 840	Authorized Officer  Morena, E Telephone No. +49 30 25901- 		

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**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
    - international search (under Rules 12.3 and 23.1(b))
    - publication of the international application (under Rule 12.4)
    - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

**Description, Pages**

1-12 as originally filed

**Claims, Numbers**

1-10 as originally filed

**Drawings, Sheets**

1/3-3/3 as originally filed

a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3.  The amendments have resulted in the cancellation of:
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):
4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseeded."

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## **Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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### 1. Statement

Novelty (N)	Yes: Claims	1-10
	No: Claims	
Inventive step (IS)	Yes: Claims	1-10
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-10
	No: Claims	

### 2. Citations and explanations (Rule 70.7):

**see separate sheet**

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## **Box No. VII Certain defects in the international application**

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The following defects in the form or contents of the international application have been noted:

**see separate sheet**

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## **Box No. VIII Certain observations on the international application**

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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1 In this Written Opinion reference is made to the following documents cited in the International Search Report:

- D1: US-B1-6 471 110 (LUECHINGER CHRISTOPH ET AL) (2002-10-29)
- D2: PATENT ABSTRACTS OF JAPAN vol. 2000, no. 14, (2001-03-05)  
& JP 2000 332495 A (SONY CORP), 30 November 2000 (2000-11-30)
- D3: US 2001/037855 A1 (TAKESHITA NAOKI ET AL) (2001-11-08)
- D4: US-A-6 146 912 (TIGHE ET AL) (2000-11-14)
- D5: PATENT ABSTRACTS OF JAPAN vol. 016, no. 312 (E-1230), (1992-07-09)  
& JP 04 087346 A (NIPPON STEEL CORP), 19 March 1992 (1992-03-19)

2 The document D1 is regarded as being the closest prior art to the subject-matter of independent claim 1 and discloses a method for gluing a circuit component to a circuit substrate comprising the steps of:

- a) seizing a circuit component using a gripper (see D1, column 2, lines 2-3);
- b) moving the gripper towards the surface of the circuit substrate to a target distance from the surface at which adhesive applied between the circuit component and the circuit substrate is pressed (see D1, column 2, lines 4-6; lines 11-15, figure 1b);
- c) releasing the circuit component (see D1, column 2, line 9) and removing the gripper from the circuit component (see D1, column 2, line 10).

The method disclosed by document D1 further includes a controlled up and down movement of the semiconductor chip, by means of which possible bubbles contained within the solder are removed (see D1, column 2, lines 31-60) and the parallelism between the chip and the substrate is increased (see D1, column 4, lines 15-31).

The subject-matter of claim 1 differs from this known method in that after releasing the circuit component, the gripper is:

- d) turned around an axis perpendicular to the surface of the circuit substrate;
- e) moved into the target distance again; and

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(SEPARATE SHEET)**

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f) removed again.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as to correct a possible residual misalignment between the component and the substrate.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

- a) document D1 does not disclose nor suggest to turn the gripper after releasing the circuit component and to further bring it in contact with the device so as to correct a possible residual misalignment;
- b) document D2 discloses how a due rotation of the circuit component in the aligning phase affects the co-planarity of the circuit component with the mounting surface (see D2, paragraphs 20-22, figure 5); however, document D2 does not suggest to exploit the rotation of the gripper in order to correct the parallelism of the circuit component during the mounting phase;
- c) documents D3-D5 suggests completely different solutions to provide a good parallelism between the device component and the circuit substrate.

3 Claims 2-10 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

4 All claims 1-10 are considered as industrially applicable, and therefore they meet the criteria of Article 33(4) PCT.

**Re Item VII**

**Certain defects in the international application**

1 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1-D5 is not mentioned in the description, nor are these documents identified therein.

**Re Item VIII**

**Certain observations on the international application**

1 It is clear from the description (see description, page 4, line 19 - page 5, line 10) that the following feature is essential to the definition of the invention:

(1) when the griper is moved in the target distance for the second time it comes in contact with the circuit component; more precisely, in step b) the local coordinates of the gripper in the target distance are detected and in step e) the gripper is in the same local coordinates as in step b).

Since independent claim 1 does not contain this feature it does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.